



Dental Radiography



The Ritter Dental X-Ray Machine

Dental Radiography



*The modern application of
the X-Ray in dentistry*



Ritter Dental Manufacturing Co., Inc.
Rochester, N. Y.



Ritter

The Ritter X-Ray Machine

It harmonizes with the best in modern dental equipment.



Radiography Supplements Professional Skill

The X-Ray Eliminates Doubt, and Brings Scientific Assurance to Dental Work

SO much depends on correct diagnosis that modern dentists recognize radiography as essential to successful practice. Years spent in acquiring professional skill, in becoming thoroughly versed in the basic principles of the science of dentistry, and in keeping abreast of the latest developments, represent an expenditure of time, effort and money for which every dentist is entitled to an adequate return.

Obscure diagnosis is an unfair handicap. No dentist can afford to "work in the dark." Ready at hand, is a scientific development that eliminates doubt, banishes guesswork, and pictures conditions as they actually exist.

The use of the X-Ray enables the practitioner to exercise his professional skill with that feeling of confidence so essential to his fullest success.

Radiography Inspires the Confidence of Patients

JUST as this scientific assurance enables the dentist to do his best work, so does the X-Ray inspire the confidence of his patients. They know little about the scientific principles of dentistry, but they do appreciate the accuracy of an X-Ray diagnosis.

With their own eyes they can see conditions that need treatment, and it is only natural that they should have greater confidence in the dentist who provides the service expected by modern patients.

The X-Ray machine reflects professional skill. It puts patients in a frame of mind where they expect, and are willing to pay for, expert dental service.

It is to the Dentist's Advantage to Operate His Own Machine

Some practitioners, while recognizing the desirability of radiographic facilities, have seen fit to "farm out" their X-Ray work to laboratories or others operating an X-Ray machine. Many operators of X-Ray machines who claim to be qualified to do this class of work are not professionally trained men. They are incapable of making correct radiographic interpretations. Then again the X-Ray equipment usually used in laboratories is designed especially for medical work. Medical machines in most cases are not suitable for dental radiography, which requires a tube with a fine focal spot as explained on Page 19.

The dentist who sends his patients elsewhere for radiographic examination loses their esteem as compared to the dentist who not only appreciates the necessity for X-Ray work, but in addition, serves the *comfort* and *convenience* of his patients by doing his X-Ray work in his own office.



The Development of a Broader Field for Dental Radiography

SINCE radiography was first adopted by the dental profession, its field of usefulness has been continuously broadened. The X-Ray machine was at first used in making radiographs of teeth that compelled patients to seek relief, and in checking up the progress of tooth treatment. The scientific accuracy of the X-Ray in this class of work was quickly recognized, and modern dentists readily appreciated its value in their diagnostic work.

The X-Ray Has Become a Vital Factor in Preventive Dentistry

The trend of modern dentistry is more and more making it a preventive science. In this development, the X-Ray is playing an important part. Radiography makes possible accurate full mouth examinations which form the basis of real diagnosis.

With the information before him that the X-Ray has revealed, the dentist is able to reinforce his "health talk" with impressive and easily visualized facts that can be *shown* as having a distinct bearing on the patient's general health.

How Radiography Affects the Dentist's Practice



IT has taken many years to educate the public to a greater appreciation of dentistry. Not so many years ago, people thought of dental work in terms of "crowns" or "bridges." They regarded these as commodities, and were very likely to seek dental service on the basis of price.

But conditions today have changed. The public, and especially that part forming the most desirable clientele, regards dentistry as an exacting science. They know little or nothing of its principles, but have a definite conception of what constitutes satisfactory dental service.

Lacking scientific knowledge, they must largely base their impressions of a practitioner's skill on the environment of the dental office, and on the nature of his equipment.

The X-Ray Machine Bespeaks Progressiveness

There is no piece of modern dental equipment that gives a stronger impression of professional skill than the X-Ray machine. To every intelligent man and woman the X-Ray indicates scientific methods.

To them it is positive proof of professional skill—it inspires their complete confidence, and bespeaks the progressiveness of the dentist who uses it in his work.

Factors That Determine the Practicability of an X-Ray Machine



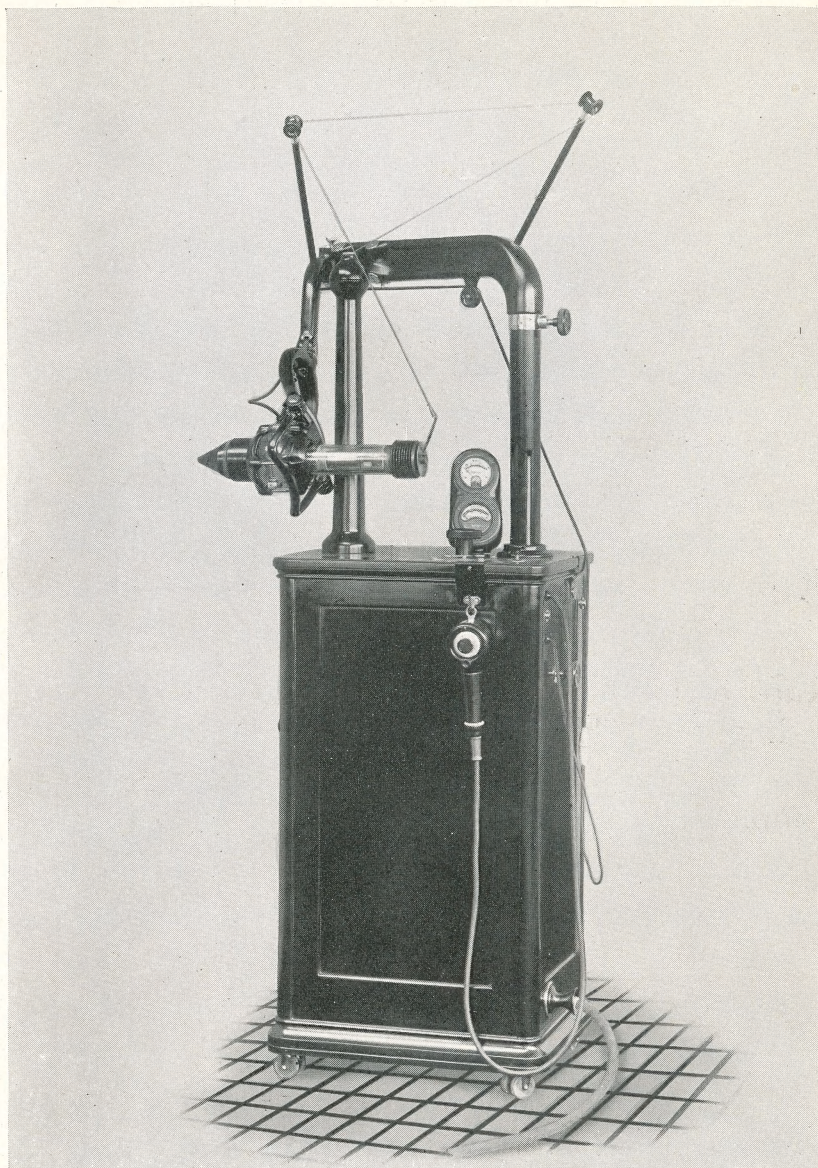
GR^EAT as is the value of the X-Ray in diagnosis, no dentist can afford the time and effort required to operate a machine that is clumsy in manipulation, or that does not completely meet the requirements of his practice.

These factors determine the practicability of any X-Ray apparatus:

Simplicity of Operation. The X-Ray machine should be one the technique of which is standardized and simple. It should be perfected to a point where satisfactory results are *assured* with a minimum of time and effort.

Flexibility and Ease of Adjustment. In radiographic work it is necessary that the apparatus be readily adjusted to correct tube positions, and that these positions be accurately maintained. The machine must be so constructed that locking devices and other time-consuming adjustments are reduced to a minimum.

Accuracy and Reliability. X-Ray films that are distorted and inaccurate are worse than none at all. They make the X-Ray a liability rather than an asset. The machine should be constructed to take radiographs that are unfailingly accurate. Above all else the mechanical and electrical construction of the machine must be such as will provide always for safe, dependable operation.



The Ritter X-Ray Machine

Entirely practicable for every phase of dental radiography.

The Ritter X-Ray Machine

*Meets the Most Exacting Requirements
of Dental Radiography*



BEHIND the Ritter Dental X-Ray Machine lie years of scientific research and painstaking study of every phase of dental radiography, undertaken by an organization that has been in close contact with the dental profession for over thirty years.

It fulfills the aim of the Ritter Dental Manufacturing Company to offer to dentists an X-Ray machine particularly adapted to their requirements—a machine as nearly perfect as scientific research and mechanical and electrical excellence can make it.

The Ritter X-Ray Machine is a unit of modern equipment that completely meets *every* requirement of dental radiography.

It Harmonizes With Modern Equipment

The pleasing lines, balanced proportions, and beautiful finish of the Ritter X-Ray Machine harmonize with the best in modern dental equipment.

Illustrations in this book show the machine in mahogany finish. It can also be supplied in Pyralin (synthetic ivory) finishes, white, ivory or gray. All finishes are carefully hand-rubbed, a process which produces the distinctive soft effects so much admired in all Ritter equipment.

Versatile in Its Application to Dental Practice

IN every detail of design, there has been strict adherence to the main objective—to make the Ritter X-Ray Machine *simple to operate and certain in its results*. This certainty of results has been attained; and the technique is so standardized and simple that any dentist can, in a short time, take uniformly good radiographs with this apparatus.

By following simple instructions in the Ritter X-Ray Machine Instruction Book the operator can quickly obtain the correct tube positions. The taking of radiographs and the development of the films are simple operations that any dentist or his assistant will readily grasp.

Designed to Take Both Intra-oral and Extra-oral Radiographs

Both intra-oral and extra-oral radiographs can be taken with a minimum expenditure of time and effort on the part of the operator.

The flexibility of this machine is quickly appreciated when it is used to take radiographs that serve as the basis of full-mouth examinations. Here speed and accuracy are particularly desirable, and the Ritter X-Ray Machine meets this requirement fully.

The structural design which makes the Ritter X-Ray Machine the most practicable for diagnostic work is of interest because it is far in advance of ordinary X-Ray equipment.

The Ritter Tube Support Makes Correct Positioning Easy

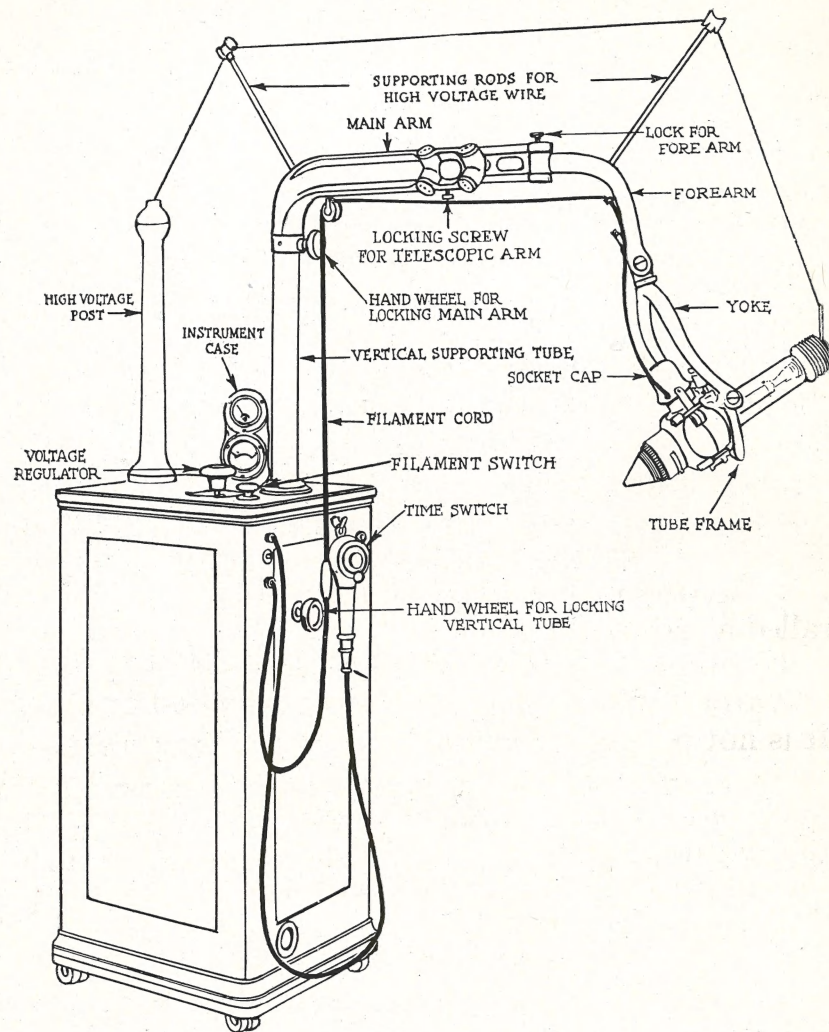
THE tube support of the Ritter X-Ray Machine is so carefully designed and so accurately counter-balanced that the X-Ray tube may be raised and lowered through its entire vertical range by the pressure of one finger.

A vertical standard to which is attached the main horizontal arm, telescope arm and fore-arm (the latter supporting the yoke and frame) constitute the tube supporting mechanism.

Provision is made for a wide range of tube adjustments. The vertical standard may be raised or lowered a distance of 24 inches without in any way disturbing the adjustments of the horizontal arm, fore-arm or yoke. Because of this, the tube may be easily positioned for the patient with the chair in either the high or the low position.

A lateral extension in the horizontal arm makes it possible to move the X-Ray tube in a horizontal plane for a distance of ten inches by the action of this arm alone.

When the X-Ray machine is not in use, the entire tube supporting mechanism folds compactly over the top of the cabinet, which protects the tube from injury. When folded, the entire machine occupies only a small floor space, about 18 by 22 inches.



The Ritter Dental X-Ray Machine

This diagram shows clearly the relative positions of the more important parts described.

The X-Ray Tube Swings Readily Into Any Desired Position

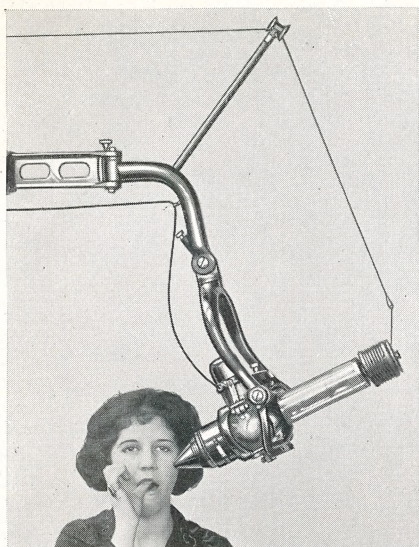
A Stereoscopic Shift, built in as a part of the Ritter X-Ray Machine, provides for the taking of radiographs that show the third dimension when viewed through a hand stereoscope. Such pictures are of much value in studying pathological conditions at the apices of the teeth, and offer an ideal means of diagnosis. They may be obtained quickly *and accurately* on the Ritter machine.

Because it may be rotated in a horizontal plane, just as readily as it moves up or down in a vertical plane, the tube holder of the Ritter X-Ray Machine is properly called a radio-compass.

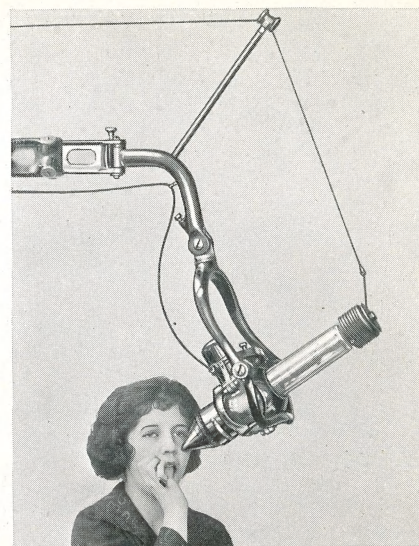
To obtain any required angle with the tube, all the operator ordinarily has to do is to swing it into position. It is not necessary for him to unlock a series of clamps, levers or springs in order to move the tube. The holder is so constructed that the X-Ray tube remains in position without vibration. Provision is made for locking the tube in position, if that is desired, as it sometimes is in making a series of stereoscopic radiographs.

Full Mouth Examinations Easily Made

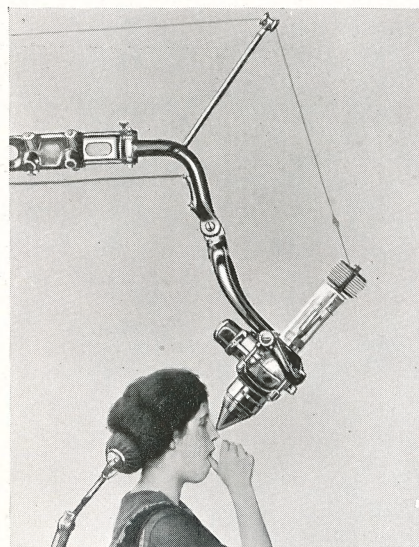
The extreme flexibility of the tube supporting mechanism, and the facility with which positions may be accurately and quickly obtained, is perhaps best demonstrated in making full mouth examinations. The X-Ray tube can be rotated around the head of the patient without the necessity of making numerous adjustments in other parts of the tube supporting arm.



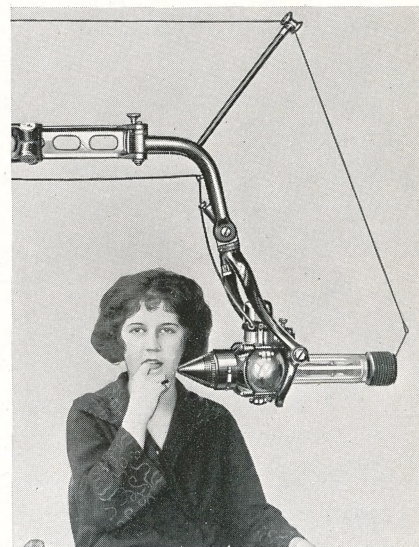
Position of X-Ray tube for radiographing Upper Molars.



Position of X-Ray tube for radiographing Upper Cuspids and Bicuspids.

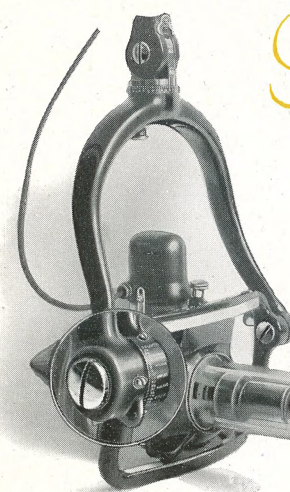


Tube in position for radiographing Upper Incisor Region.



Tube in position for radiographing the Lower Molars.

Provision for Comparison of Diseased and Normal Areas



One of the three calibrated scales on the Ritter tube-holder.

No matter what the angle of the X-Ray tube may be, the high tension wire is so placed that the high voltage current is never brought within sparking distance of operator or patient, or any part of the tube holder.

Extreme flexibility of the tube-holder makes it possible to take a radiograph of an infected area or diseased bone on one side, and of obtaining a picture of normal tissue or bone on the other side, from *exactly the same angle*, as shown by calibrated scales.

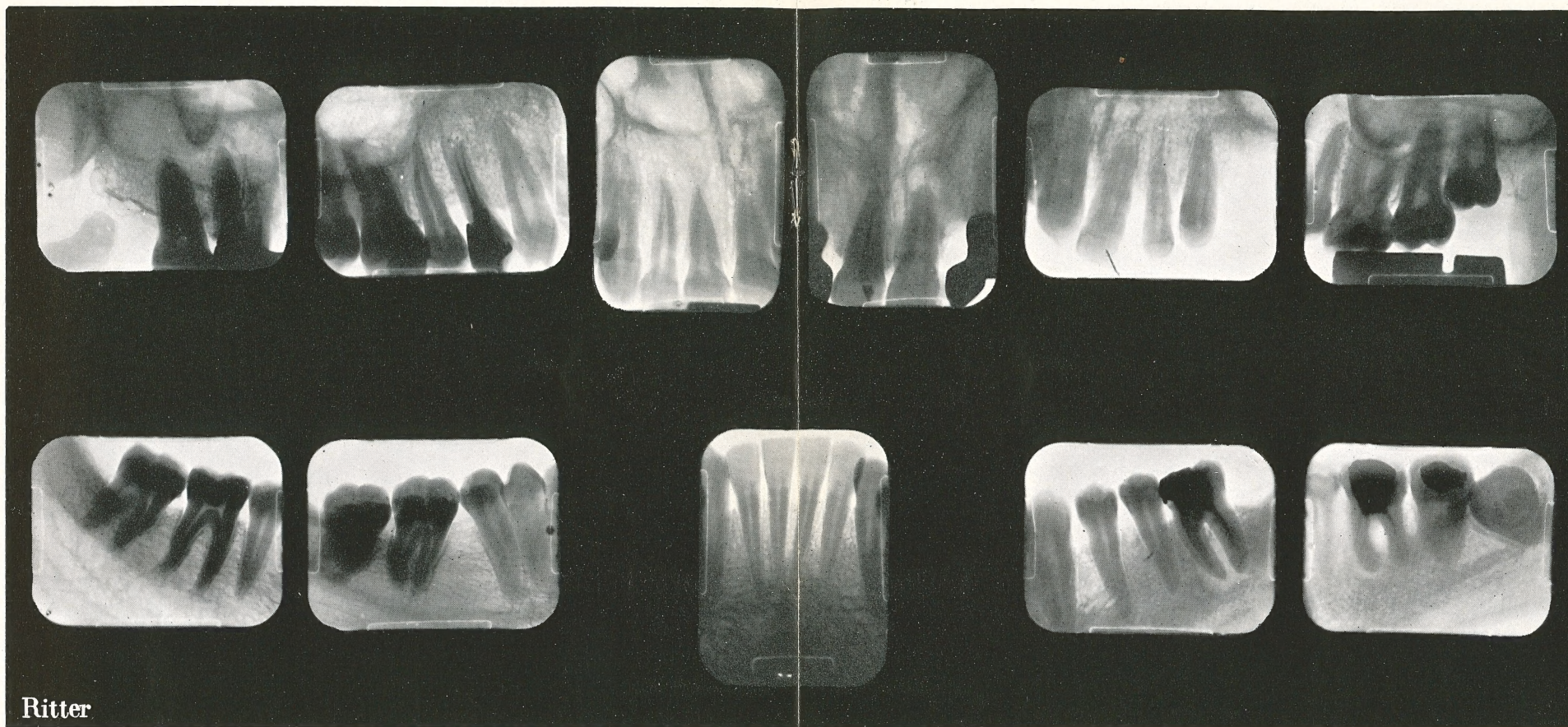
Calibrated Scales on the Tube Holder

At pivotal points throughout the tube supporting arm and holder are calibrated scales for use in recording the exact angle of any tube position. These scales not only make it easy for the operator to obtain any desired tube position quickly and accurately, but they enable him to record the exact angle at which the tube is set.

Location of Ritter X-Ray Machine

The distance through which the entire tube supporting mechanism may be moved, and the flexibility of its adjustments, make it possible to place the Ritter X-Ray Machine in spaces that would not otherwise be practicable.

Except where there is a separate diagnostic room, the recommended position for the X-Ray machine is at either the left or the right of the dental chair, and a little to the rear of the head rest. With the machine so placed, the tube is readily swung into position.



A Full Mouth Examination is the Basis of Real Diagnosis

A Full mouth radiographic examination should form the basis of a real diagnosis because it gives the dentist a complete picture of dental conditions. It clears up all uncertainties—visualizes the facts. Many authorities strongly advise such examinations before any dental treatment is attempted.

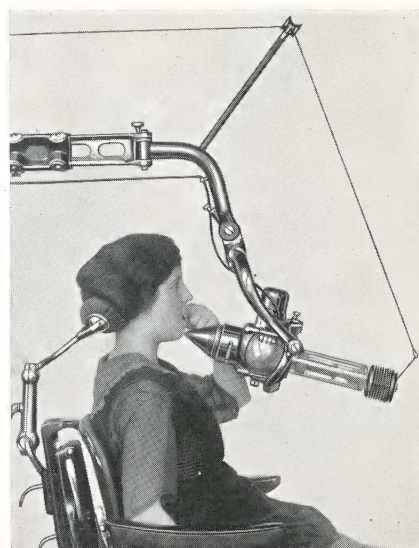
Such a set of films often discloses unsuspected conditions not within the immediate realm of dentistry that are a menace to the patient's general health. The revelation of such conditions constitutes a health service beyond price. It is a service that wins great

respect for the dentist's ability and a service that patients are willing to pay for.

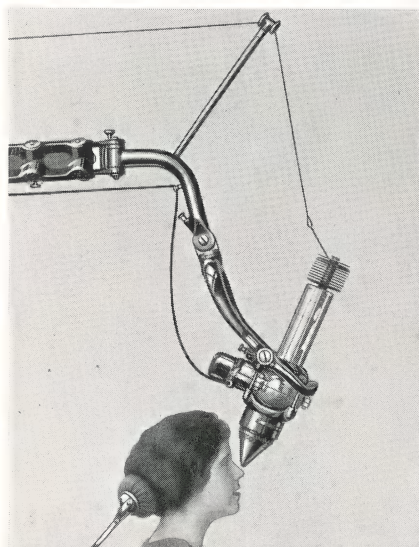
Radiographic examination of the full mouth is a vital factor in preventive dentistry, which is dentistry in its best modern application. The radiograph should be used not only to discover present diseased conditions but also to remove possible causes of trouble at some subsequent time. In making a full mouth examination, eleven films are necessary. The pictures here show a reproduction of a full mouth examination made by the Ritter X-Ray Machine.



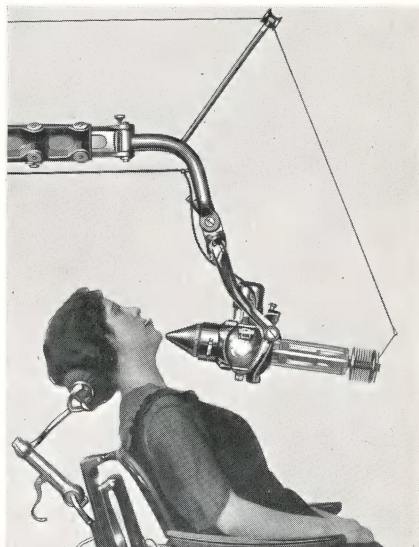
Position of X-Ray tube for radiographing the Lower Cuspids and Bicusps.



Position of X-Ray tube for radiographing Lower Incisor Region.



Tube in position for radiographing Upper Anteriors Using the Bite Method.



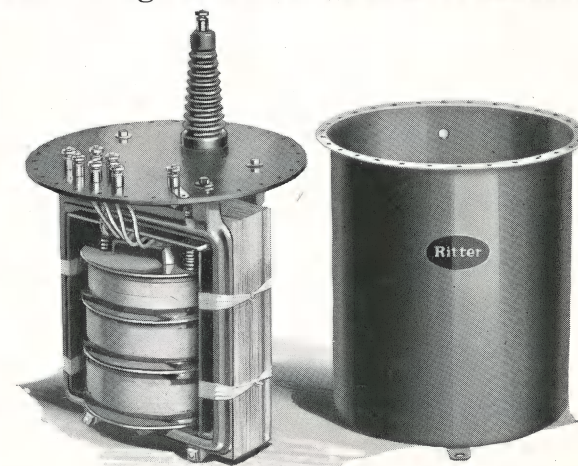
Tube in position for radiographing Lower Anteriors Using the Bite Method.

The Tube is Specially Adapted to Dental Radiography

THE X-Ray tube used on the Ritter Dental X-Ray Machine is the right angle dental Coolidge tube, radiator type, self-rectifying, and is designed to operate on a current of 45,000 volts and 10 milliamperes. Detail is essential in radiographs of bone, and because of the fine focal point of the Coolidge *dental* tube the Ritter machine takes radiographs that are clearer in detail than those that would be secured with the use of the *standard* Coolidge tube or the gas tube. A shield of lead glass completely surrounds the tube, confining the X-Rays and thus protects the operator and patient.

In order to obtain satisfactory radiographs, it is essential that the voltage be *maintained* at the correct point. The importance of voltage is realized when we learn that the penetration of the X-Ray increases with the *first power* of the current flow (milliamperage) and with the *square* of the voltage.

The high tension transformer of the Ritter X-Ray Machine is manufactured exclusively by the Ritter Company. The special design and construction of the core reduce vibration and provide a secondary current of maximum voltage and *penetration* with a minimum consumption of supply current. The core and windings are immersed in a special insulating oil.



Ritter X-Ray Transformer.

Current Measuring Instruments can be Read from Any Position

The current measuring instruments of the Ritter X-Ray Machine consist of a voltmeter for registering primary voltage and a milliammeter for determining the flow of current through the X-Ray tube. Both meters are mounted in a single case on the top of the cabinet. The case may be revolved and the meters read easily from any position in which the operator may be standing.

It is this complete control over all electric adjustments that makes it so easy for the operator to obtain uniformly satisfactory radiographs with the Ritter X-Ray Machine.

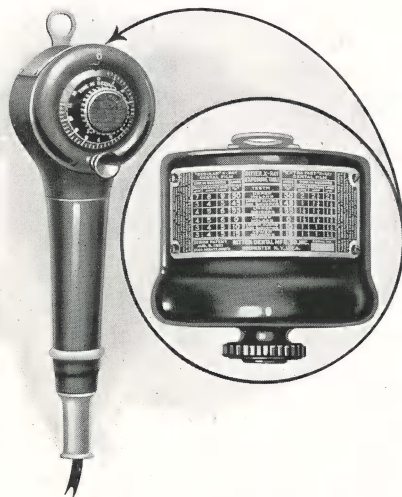


The Voltmeter and
Milliammeter.

Exposure is Timed Automatically and Exactly

An automatic timing switch, which does not require winding, and which contains no springs to become magnetized, controls the length of exposures.

This switch cannot run down while a radiograph is being taken, nor can there be any accidental over or under-exposure. The dial is set at the determined length of exposure, and the timing is positive, the current being automatically shut off at the expiration of the time for which the dial is set.



View in circle shows Exposure Chart located on top of time switch as indicated by arrow. Cut of Chart approximately one-third actual size.

The Attractive Cabinet Provides Factors of Convenience and Safety

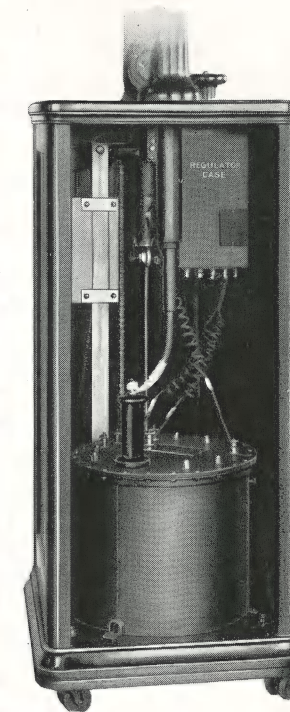
THE transformers, current regulating mechanism, and counterbalancing parts of the tube support are enclosed in a well-built, attractive cabinet of Honduras Mahogany. It is forty-one inches high, eighteen inches wide, and twenty-two inches deep.

Only the best grades of wood obtainable are used in its construction. It is built with a five-ply floor and top to prevent shrinking or checking at the corners. The laminated side panels may be removed and replaced in case of accidental injury.

The electrical parts enclosed in the cabinet are simply arranged so as to be accessible in case of needed adjustment or replacement. *Simplicity in X-Ray apparatus means safety.*

The Ritter X-Ray Machine Has Set the Pace in Radiographic Development

Since it was first offered to the dental profession, the Ritter X-Ray Machine has set the pace in making more practicable the application of radiography to dental practice. Every factor of accuracy for the operator and convenience for the patient has been provided for. Simplification in every part, and standardized operating technique have eliminated many of the variable factors which had to be contended with in the past.



Interior of Cabinet.



A photographic reproduction of an unretouched X-Ray film showing the Lateral Jaw. Made with the Ritter X-Ray Machine with Ritter 45,000-volt transformer and 10-milliamperes Coolidge tube

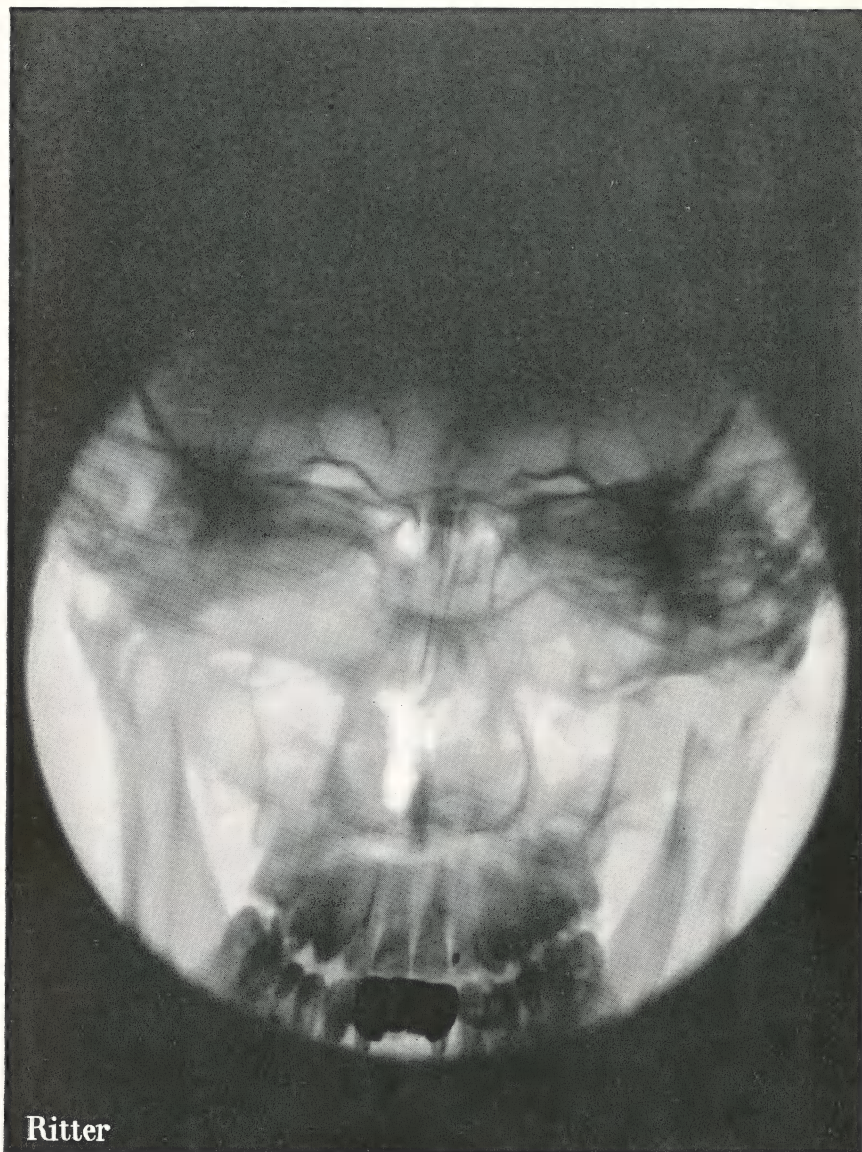


Extra-Oral Radiographs Supplement Intra-Oral Films in Diagnosis

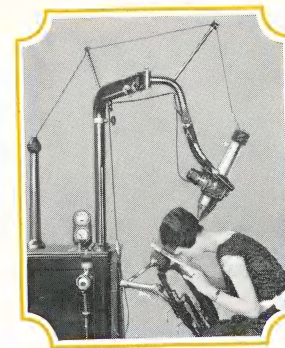


TO diagnose conditions of small localized area, the intra-oral method of taking radiographs is generally satisfactory. Radiographs properly made in this way are always clear in detail because the radiograph is taken from a position close to the object, and there is less chance of distortion or superimposition of shadows.

There are times, however, when the examination of intra-oral radiographs leaves some doubt, and it is then that extra-oral or lateral jaw radiographs become a real help in the diagnosis. The latter show conditions over a larger area and furnish the basis for a more comprehensive view of the conditions existing. Extra-oral radiographs may also be made easily many times with patients who are inclined to gag, or when the vault of the mouth is unusually low, making satisfactory intra-oral pictures difficult or impossible.



A photographic reproduction of an unretouched X-Ray film showing the frontal and maxillary sinuses. Made with the Ritter X-Ray Machine with Ritter 45,000-volt transformer and 10-milliamperere Coolidge tube. In the Ritter X-Ray Machine, provision is made not only for the control of current, but also for the control of voltage—the more important factor in the electrical adjustment of an X-Ray machine.



Frontal and Maxillary Sinus Anterior-Posterior View



IN such a radiographic film, spaces in the bone should appear black. If the sinuses are in normal condition, they will appear black. If the film shows them gray, it is an indication that the sinuses have become filled with fluid, pus or exudate as a result of some pathological condition.

A diagnosis to determine whether a sinusitis is present may be made radiographically by taking anterior-posterior views and comparing the relative densities of the sinuses. The one that appears gray (sometimes both appear gray) is the affected sinus.

The flexibility and ready adjustments of the tube support of the Ritter X-Ray Machine make the taking of anterior-posterior radiographs a comparatively simple task. The desired positions of the X-Ray tube can be quickly attained, and held. Such films properly made clearly show sinus conditions and eliminate all guesswork.



A photographic reproduction of an unretouched X-Ray film of the hand. Made with the Ritter X-Ray Machine with Ritter 45,000-volt transformer and 10-milliamperes Coolidge tube.



The Ritter X-Ray Machine Will Make Extremity Radiographs

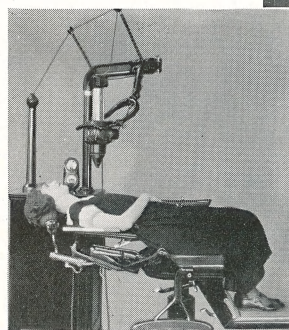
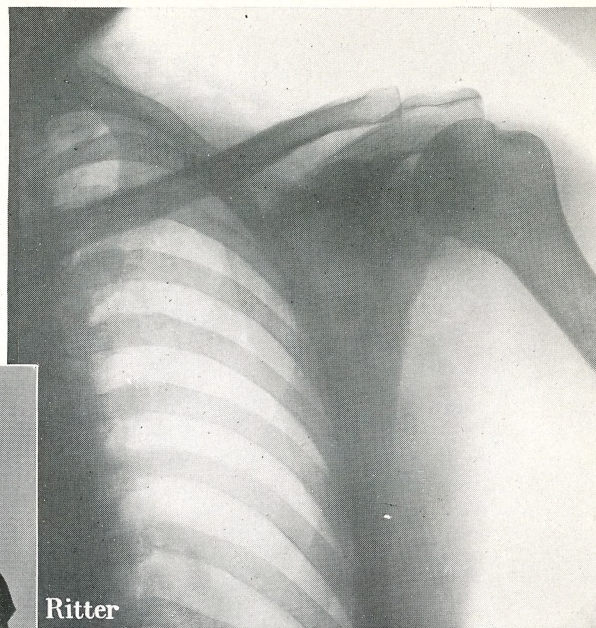


SO versatile is the Ritter Dental X-Ray Machine that it is readily adapted to the making of radiographs of parts of the anatomy other than the oral cavity. In some communities where modern facilities are lacking, dentists operating a Ritter machine have found it profitable and interesting work to take extremity radiographs for physicians and surgeons.

The operating technique is slightly different from that required to make intra-oral radiographs, but with the aid of simple instructions furnished the owner of the Ritter machine, the dentist can quickly master this phase of radiography.

The dental chair offers an excellent means for positioning patients in taking extremity radiographs. It is easy to raise and lower the chair as well as tube-stand of the machine to any required position.

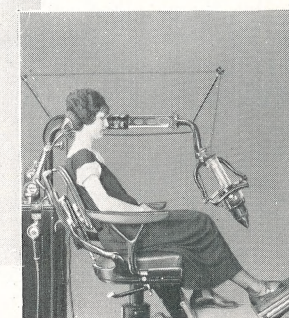
These pictures show how easy it is to use the Ritter Dental Chair for obtaining proper patient positions for extremity radiographs.



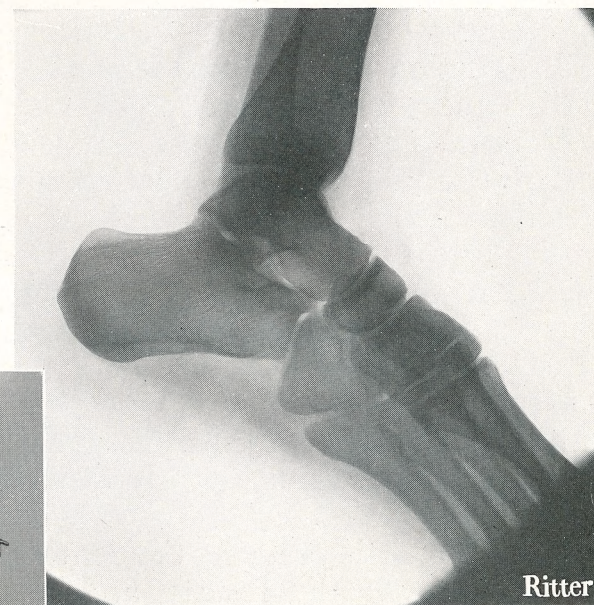
The films of the shoulder and elbow are unretouched and made with the Ritter X-Ray Machine with the regular transformer and 10-milliamper tube.

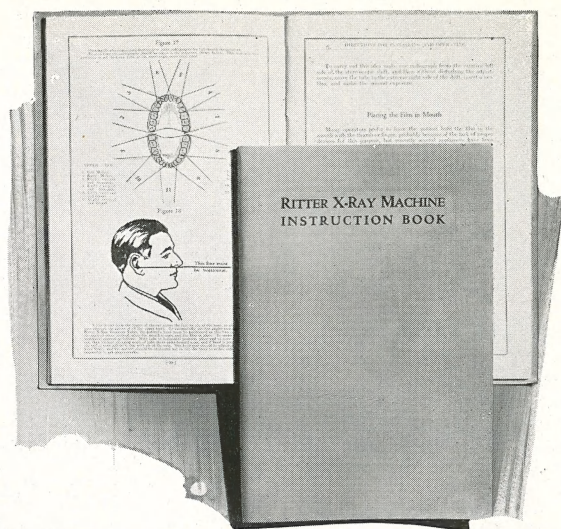


These pictures show how easy it is to use the Ritter Dental Chair for obtaining proper patient positions for extremity radiographs.



The films of the foot are unretouched and made with the Ritter X-Ray Machine with the regular transformer and 10-milliamper tube.





This complete and easy-to-read handbook on radiographic technique.

Insures Success in Using The Ritter X-Ray Machine

THOSE who have used the Ritter X-Ray Machine Instruction Book regard it as the most comprehensive and complete set of X-Ray directions ever published. The book covers sixty-four pages, dealing with intra-oral, extra-oral, lateral jaw, sinus and extremity work.

It is furnished without charge to every purchaser of the Ritter X-Ray Machine, and represents a typical phase of Ritter service—helpful suggestions that insure satisfactory results.

Dental practitioners welcome this practical combination of an efficient X-Ray machine, and the simple, standardized technique clearly explained in the handbook.

With but little practice, the dentist, or his assistant, can obtain splendid results, and can supplement his professional skill with the scientific assurance that radiography brings to his work.

Ritter Dental Equipment

Chairs

Engines

Lathes

Air Compressors

Unit Equipments

X-Ray Equipments

Ionization Equipments

Spray Bottle Warmers

Tooth Testers

Supplies and Accessories
for the above

Descriptive Literature on Request

Ritter Dental Manufacturing Co., Inc.
Rochester, N. Y., U. S. A.

*The largest concern in the world devoted exclusively
to the manufacture of Dental Equipment.*

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Cleveland